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OF THE

DEEP PRETIBIAL BURSA

WITH A REPORT OF CASES

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Presented by the author

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BURSITIS OF THE DEEP PRETIBIAL BURSA, WITH A REPORT OF CASES.

By Robert W. Lovett, M.D.

A bursa of considerable size lies beneath the ligamentum patellæ. Its existence has been for a long time recognized in most text-books and treatises on anatomy,[1] and it is indicated, almost always incorrectly, in diagrams of the knee-joint. Anatomically and surgically it has received but little attention, and no one name has been given to it, for it is so little known that each writer who has mentioned it has called it what he chose.

As a matter of identity, some of its names, at least, must be mentioned:

Bursa (mucosa) infragenualis. Koch.
Bursa ligamenti patellæ. Soder.
Bursa de capsule inferieure de genou. Lauth.
Bursa infra patellaris profunda. Gruber.
Bursa ligamenti patellæ posterior. Gruber.
Bourse sous rotulienne profond. Poirier.
Bourse propre du ligament rotulien. Poirier.
Bourse sous ligamenteuse. Follin et Duplay.
Bourse prétibiale. Dubrueïl.
Subligamentous bursa of the knee.
Deep pretibial bursa.

By the kindness of Professor Dwight the writer was enabled to study this bursa in 48 knees in the dissecting room of the Harvard Medical School, as well as in some wet preparations of the knee. In one knee ankylosis was present, and it was of interest to note that no trace of the bursa, as such, could be found. The ligamentum patellæ was apparently applied directly to the tibia in this case. In the 48

[1] Fourcroy, Mem. de l'Acad. de Med., 1787, p. 291.

cases observed, the cavity of the bursa was always smooth and unilocular. There were no trabeculæ present, and the shape and position were practically constant. The amount of fluid contained varied, but this was probably more affected by the amount of moisture in the subject than by any other cause.

The boundaries of this bursa are as follows:

Above it rises to the level of the front part of the articular surface of the tibia, and the upper line of the bursa is parallel to and level with that. Its relation to the pad of pretibial fat, which lies behind the lower surface of the patella, varies. Often the lower edge of the fat hangs as a curtain into the bursa, sometimes for half an inch. In these cases the bursa extends up behind and in front of the lower part of the pad of fat. More often the bursa extends up in front of the pad, which in the latter case lies against the tibial surface.

Posteriorly the bursa lies closely on the periosteum of the tibia.

In front it is in contact with the under surface of the ligamentum patellæ. It is as wide as the ligament and in some cases a little wider. When distended it is obvious that its only expansion must be at each side of the ligament. The patella tendon is inserted obliquely into the tubercle of the tibia much lower down at its outer than at its inner border. Consequently the lower border of the bursa, which is determined by this insertion, is oblique, also sloping downward and outward. The inner vertical border of the bursa is much shorter than the outer vertical border. As a result of this, the bursa is approximately triangular in shape.

Although it is sometimes[1] asserted that this bursa may communicate with the knee-joint, it is obvious, on dissection, that this is not likely to be the case. Its upper level reaches nearly to the joint, but it is separated by a thick pad of fat in all directions, from the synovial membrane. The bursal cavity is always well defined, and only

[1] Scrachley, Thèse de Paris, 1839. Tillaux and Panas, quoted by Dubrueïl. Annales d'orth., Sept. 1, '90, p. 323. Villermé, Blandin, Velpeau, quoted by Gruber. Die Knie Schleimbeutel, Prag, 1857, p. 10. Cruvelhier, quoted by Poirier, 1886, 17, 7me Serie, 705.

superficial dissection could favor the idea of communication. Poirier, in 300 knees examined, found no connection. Gruber, in 600 knees, found communication once by a well-marked canal. Ulcocq examined 20 knees without finding a case of communication. Dubrueïl examined 30 knees without a positive result; Feraud 16 knees with similar conclusions; and Bouquet[1] 12 knees. Therefore, in about 1,000 knees examined in this regard communication with the synovial membrane existed once only.

On the skin the bursa may be mapped out as follows: It should reach to the anticular surface of the tibia above, and below to the lower half of the tubercle. At the outer edge of the ligament it extends to the lower part of the tubercle. Laterally it should not project beyond the ligament, nor should it fill out the hollows on both sides of the ligament, which are most evident in semiflexion of the knee.

Cases where inflammation of this bursa have been reported are few.[2] Trendelenburg describes some cases under the name of Hygroma infra patellare profundum.[3] Dubrueïl[4] would speak of the affection as "Pseudoarthrose du Genou." Follin[5] and Duplay speak of "Hydropsie" of the bursa placed beneath the ligamentum patellæ, and Heineke[6] and Pitha[7] also speak of the affection, although the latter had never seen a case. Feraud reports five cases.[8] There are other occasional references to the affection.[9]

The writer would report five cases, all of mild grade, and can recall several others seen from time to time where the affection was not recognized by him, but where inflammation of this bursa probably existed. It cannot be a very uncommon affection.

The *symptoms* of inflammation of this bursa are as fol-

[1] Bouquet, Thèse de Paris, 1864, No. 183, p. 23.

[2] Roswell Park; operative case; man 40 years old; 1 year duration. Internat. Clinics, 4th series, II., p. 156.

[3] Archiv. fur klin. Chir., 1877, XXI., p. 132. Two cases reported; not operated.

[4] Annales d'orthopedie, Paris, September, 1890.

[5] Traité de Pathologie externe, III., p. 19. The pathology apparently differs in no way from that of the affections of other bursæ.

[6] Heineke, Anat. & Path. der Schleimbeutel, etc., Erlange, 1868, p. 108.

[7] Pitha and Billroth, Chirurgie IV., I., Heft 2, p. 242.

[8] Feraud, Thèse de Montpellier, 1880.

[9] Edw. Scrachley, Thèse de Paris, 1839, No. 34.

lows: Pain and stiffness in walking, especially in going upstairs. Pain on extreme flexion of the leg, and especially pain in complete extension referred to the ligamentum patellæ. The latter is so marked that the patient generally walks on the toe of the affected leg. The tubercle of the tibia is more prominent than normal and appears to be thickened. The ligamentum patellæ is tender, especially at its insertion into the tubercle, and is more prominent than usual. On examination it is seen that at each side of the patella tendon there is a bulging prominence which fluctuated in the severer cases. This is due to the distended bursa. Semiflexion of the knee makes this more evident. The patella does not float unless synovitis of the knee is also present.

The *diagnostic* points are these: Pain and tenderness referred to the patella tendon, especially to its outer aspect. Apparent enlargement of the tubercle of the tibia. Severe pain chiefly in complete extension of the leg, especially against resistance. Prominences instead of hollows on both sides of the ligamentum patellæ in semiflexion of the knee.

These points will serve for its differential diagnosis from other affections of the knee-joint.

The affection most likely to be confused with it is inflammation of the superficial pretibial bursa, of which cases have been reported by Monks and M. H. Richardson;[1] but in these cases the swelling lies anterior to the ligament. The inflammation of abnormal bursæ in this situation may also be mistaken for this affection, as was demonstrated by Delore.[2]

In all the cases seen by the writer the progress has been unwarrantably and discouragingly slow, much more so than in a synovitis of the knee of apparently the same grade.

The *treatment* has been fixation as complete as possible, preferably by a ham splint or by plaster of Paris, until tenderness has nearly disappeared and until complete flexion can be accomplished without pain. Then the splint has been gradually discontinued and a flannel bandage substi-

[1] Boston Med. & Surg. Journal, Dec. 18, 1890.

[2] Gaz. Hebdom. de Med. et de Chir., June 2, 1894, p. 255.

tuted for it. Massage has been of benefit in the later stages, but in one case did harm during a subacute condition. More serious cases than those described might demand aspiration or incision.

Case I. — The first case recognized was Feb. 28, 1891. Clara J. P., twelve years old. Came to the Children's Hospital complaining of trouble in the right knee of four weeks' duration. No cause was known. The symptoms complained of were pain and catching, and inability to extend the leg fully. Flexion to any marked degree was painful. There was no effusion in the joint. The tubercle of the tibia was apparently enlarged and the ligamentum patellæ was tender. A ham splint was applied, and iodine was used. April 7, flexion to a right angle was permitted. April 21st, nearly three months after the beginning of the trouble, the knee was apparently well and treatment was discontinued.

Case II. was seen at the City Hospital, and was in a girl of the same age and almost identical with the one reported above.

The case is reported only from the writer's recollection, but the duration was similar to that in Case I. and the treatment was the same.

Case III. — A lady of forty-five, with beginning rheumatoid arthritis, fell from her bicycle, striking the front of her left knee. She rode several miles after this without very much suffering. The next day she was unable to extend the leg fully, and the knee felt stiff. She stayed most of the time in bed, and each time after a rest was better; but going upstairs was very uncomfortable, and she walked mostly on her toe on account of the persistent pain in straightening the leg. Three weeks after the accident she consulted the writer. There was no acute synovitis of the knee, as shown by floating patella or thickened joint sac. The deep pretibial bursa bulged out slightly on each side of the tendon of the patella. Tenderness and apparent enlargement of the tubercle were present.

As the affection was manifestly much better and improving, and as it was not practicable for the patient to wear a

splint, a stout flannel bandage was employed along with iodine and enforced rest. After five weeks of this, and eight weeks after the accident, recovery was nearly complete and the limp scarcely perceptible. The last symptom noticeable was pain in fully extending the knee; pain in extreme flexion was at no time a marked feature in this case. Massage proved of benefit in the latest stages of the affection.

Case IV. — A surgeon contracted a synovitis of the right knee. No cause could be found, and after a week of going about on it he submitted to a plaster cast, and on recovering from the joint effusion he found the deep pretibial bursa distended and creaking on flexion. It persisted long after the synovitis was well, and creaking in the bursa still exists after two years. He had not at any time pain in either the joint or bursa.

Case V. — A doctor of thirty-five, unusually well-developed and a trained athlete, fell in March, 1896, slipping on a piece of ice and striking his knee. He had what appeared to be a slight synovitis which caused much swelling, but he had no treatment beyond bandages and liniments and kept about his work. In three or four weeks the knee was practically well. In May, however, when he began to ride his bicycle, he found that complete extension and extreme flexion were both painful after a long ride. He gave up bicycling and limped for a few weeks. In July he went to the seashore and played golf, tennis, etc., but the knee was a little troublesome, and about the first of August he slipped in a wet tennis court and was compelled to give up active exercise.

He consulted the writer Sept. 8, 1896. He walked with the knee flexed and limped markedly. He had no apparatus on the knee and complained chiefly of the pain in complete extension. There was a slight synovial effusion, but the joint sac was not thickened, and symptoms of synovial inflammation severe enough to cause the disability were lacking.

Pain in movement was referred to the tendon of the patella. It was tender, and there was a slight fluctuating

swelling on each side of it. The tuberosity was enlarged and tender. The diagnosis of bursitis of the deep pretibial bursa was made along with a slight degree of synovitis and a plaster bandage applied. Pain disappeared at once, the effusion absorbed in the joint, and the local symptoms improved. Fixation was continued for nearly three months, until it was possible for the patient fully to extend the knee against resistance without pain. It is interesting to note that during the summer the patient, on his own responsibility, tried massage, which only served to make matters worse.

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